

1 WHAT IS CLAIMED IS:

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3 1. A current detector for detecting or measuring an electric
4 current, comprising:

- 5 (a) a Hall-effect device for generating a voltage proportional to mag-
6 netic field strength;
7 (b) two current path terminals for the inflow and outflow, respec-
8 tively, of a current to be detected or measured; and
9 (c) a metal-made baseplate mechanically supporting the Hall-effect de-
10 vice, the baseplate being slitted to define a current path
11 having a pair of opposite extremities connected respectively
12 to the current path terminals, the current path being con-
13 tiguous to the Hall-effect device for causing the same to
14 generate a voltage proportional to the magnitude of a cur-
15 rent flowing through the current path.

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17 2. The current detector of claim 1 wherein the current path
18 in the baseplate is in the shape of a U.

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20 3. The current detector of claim 2, wherein the Hall-effect
21 device has a primary working part for the development of the voltage
22 proportional to the magnitude of the current flowing through the current
23 path in the baseplate, the primary working part being substantially thor-
24 oughly contained within the U-shaped current path as seen in a direction
25 normal to the baseplate.

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27 4. The current detector of claim 2 wherein the baseplate has
28 formed therein at least one slit bounding one side edge of the U-shaped
29 current path, and at least one other slit bounding another side edge of
30 the current path.

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32 5. The current detector of claim 4 wherein said other edge of
33 the current path is bounded by a plurality of straight slits cut into the
34 baseplate.

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36 6. The current detector of claim 2 wherein the U-shaped cur-

1 rent path is defined at least in part by a J-shaped slit cut into the
2 baseplate.

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4 7. The current detector of claim 2 wherein the U-shaped cur-
5 rent path is defined at least in part by a pair of straight slits cut into
6 the baseplate and extending in parallel spaced relationship to each other.

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8 8. The current detector of claim 2 wherein the U-shaped cur-
9 rent path is defined at least in part by a single straight slit cut into
10 the baseplate.

11
12 9. The current detector of claim 2 wherein the baseplate is a
13 generally rectangular piece of sheet metal, and wherein the current path
14 terminals are integrally joined to one edge of the baseplate.

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16 10. The current detector of claim 2 wherein the baseplate is a
17 generally rectangular piece of sheet metal, wherein one current path ter-
18 minal is integrally joined to a first edge of the baseplate and directly
19 connected to one end of the U-shaped current path, and wherein the
20 other current path terminal is integrally joined to a second edge, opposite
21 to the first edge, of the baseplate and connected to the other end of
22 the current path via an extension thereof.

23
24 11. The current detector of claim 10 wherein the baseplate has
25 at least one slit cut therein from the first edge thereof to bound one
26 side edge of the U-shaped current path, and another slit cut therein
27 from the second edge thereof to form the extension of the current path.

28
29 12. The current detector of claim 11 wherein said one edge of
30 the U-shaped current path is bounded by a J-shaped slit.

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32 13. The current detector of claim 11 wherein said one edge of
33 the U-shaped current path is bounded by a pair of straight slits cut
34 into the baseplate so as to extend in parallel spaced relationship to each
35 other.

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1 14. The current detector of claim 1 further comprising an insu-
2 lating layer interposed between the baseplate and the Hall-effect device.

3 15. The current detector of claim 14 further comprising a
4 shielding plate interposed between the Hall-effect device and the insulat-
5 ing plate.
6

7 16. The current detector of claim 1 further comprising a plural-
8 ity of lead terminals for connecting the Hall-effect device to external cir-
9 cuits, the lead terminals being made from the same sheet metal as is the
10 baseplate.
11

12 17. The current detector of claim 16 further comprising an en-
13 closure of electrically insulating material enveloping all the listed compo-
14 nents of the current detector but parts of the current path terminals and
15 the lead terminals.
16

17 18. The current detector of claim 1 wherein the Hall-effect
18 device is formed in a semiconductor substrate in which there is also
19 formed an amplifier for amplifying the output voltage of the Hall-effect
20 device.
21

22 19. A current detector for detecting or measuring an electric
23 current, comprising:
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- 25 (a) two Hall-effect devices each for generating a voltage proportional
26 to magnetic field strength;
27 (b) two current path terminals for the inflow and outflow, respec-
28 tively, of a current to be detected or measured; and
29 (c) a metal-made baseplate mechanically supporting the Hall-effect de-
30 vices, the baseplate being slitted to define a current path
31 having a pair of opposite extremities connected respectively
32 to the current path terminals, the current path being conti-
33 guous to the Hall-effect devices for causing the same to
34 generate voltages proportional to the magnitude of a current
35 flowing through the current path;
36 (d) whereby the magnitude of the current flowing through the cur-

1 rent path is detectable in terms of the sum of the abso-
2 lute values of the output voltages of the Hall-effect de-
3 vices.

4
5 20. The current detector of claim 19 wherein the current path
6 in the baseplate is in the shape of an S.

7
8 21. The current detector of claim 20 wherein the baseplate is
9 a generally rectangular piece of sheet metal having a first edge, a second
10 edge opposite to the first edge, a third edge at right angles with the
11 first and the second edge, and a fourth edge opposite to the third edge,
12 wherein the baseplate has a first slit cut into the baseplate from the
13 first edge thereof to bound part of one side edge of the S-shaped cur-
14 rent path, and a second slit cut into the baseplate from the second edge
15 thereof to bound part of another side edge of the current path, wherein
16 the current path comprises a first part between the third baseplate edge
17 and the second slit, a second part between the first baseplate edge and
18 the second slit, a third part between the first and the second slit, a
19 fourth part between the second baseplate edge and the first slit, and a
20 fifth part between the fourth baseplate edge and the first slit, and
21 wherein the two current path terminals are joined respectively to the
22 first and the second edge of the baseplate in positions contiguous to the
23 first and the fifth part of the current path.

24
25 22. The current detector of claim 21 wherein each Hall-effect
26 device has a primary working part for the development of the voltage
27 proportional to the magnitude of the current flowing through the current
28 path in the baseplate, the primary working parts of the two Hall-effect
29 devices being substantially thoroughly contained respectively between the
30 first and the third part, and between the third and the fifth part, of
31 the current path, both as seen in a direction normal to the baseplate.

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33 23. The current detector of claim 19 further comprising an out-
34 put circuit for combining the absolute values of the output voltages of
35 the Hall-effect devices.

1 24. The current detector of claim 23 wherein the output circuit
2 comprises:
3 (a) two amplifiers connected respectively to the Hall-effect devices;
4 and
5 (b) arithmetic means connected to the amplifiers for providing an
6 output representative of the sum of the absolute values of
7 outputs from the amplifiers.
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